1854MNRAS..15...60P

The following communication relative to the elements of Comet II. 1854, has been received from Mr. Powell. It will be seen that it includes the application of the corrections for aberration and parallax, which were not taken into account in his previous investigations.

Correction of the Elements of Comet II. 1854.
By E. B. Powell, Esq.

Greenwich M.T.	Long. Observed, Corr. for Aberr. and Parallax.	Corr. Applied.	Lat. Observed, Corr. for Aberr. and Parallax.	Corr. Applied.
April			(South)	
	° ′ ″		° ′ ″	
8·06067	49 51 43	+47	5 22 57	+33
13·087693	59 0 44	+41	12 33 45	+26
27·08739	75 31 8	+31	24 29 4	+16

The sun's real Long. was used, instead of that in the *Nautical Almanac.*

"The aberration was obtained from the diurnal motion and distance of the comet by means of a table in Vince's Astronomy; and the parallax was found roughly by taking the height and longitude of the nonagesimal from a large celestial globe, and then applying calculation.

"On pushing further the approximations, I found

D, the perihelion distance = ·2773579
E, the time of perihelion passage = March 24·010625

which afforded the errors of anomaly,

$u - \nu = +\ 1''$, from 8th to 13th, in an angle of 10° 41′
$u' - \nu' = -16''$, from 8th to 27th, in an angle of 27 11

"If D be diminished by ·00003, the errors become

$$u - \nu = +6'' \quad \text{and} \quad u' - \nu' = -6''$$

and therefore less on the whole; but I have no doubt of the observation of the 27th being more inaccurate than those of the 8th and 13th; and, consequently, I am inclined to prefer the value of D first mentioned.

"The resulting elements are

D = ·2773579
E = March 24th, ·010625, or 24th, $0^h\ 15^m{\cdot}3$
Inclination of Orbit = 82° 26′ 43″
Long. ☊ = 315 30 11
Long. ϖ on ecliptic = 167 56 19
Motion retrograde.

"Working out the comet's place on the 18th,

The error of long. = about 10″
The error of lat. = about 4

Downloaded from http://mnras.oxfordjournals.org/ by guest on August 16, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System

1854MNRAS..15...61M

The very great obliquity of the orbit affects the accuracy of the determination of the inclination, the angle in the numerator of the expression,

$$\cos i = \frac{\sin (\phi - \phi')}{\sin (v' - v) \,.\, \sec \lambda \,.\, \sec \lambda'}$$

being only 4° 19′ 13″, using the interval from the 8th to the 27th.

"It may be remarked that Pontécoulant's modification of La Place's method of approximating to the two fundamental elements gives an error of about —·0056 in the perihelion distance, and one of about —·0078 days, or —11 minutes, in the time of perihelion passage.

"*June 5th,* 1854."

Observations on an important Phenomenon observed with regard to the Hill of Santa Lucia, situated in the City of Santiago de Chile. By Don Carlos Moesta.

"The summit of the hill of Santa Lucia, situated in the capital of the Republic of Chili, is 630 mètres above the level of the sea, and about 60 above the city. Its greatest base is from N. to S., measuring some 5 cuadras (the cuadra is 150 varas square); its perpendicular line scarcely 2 cuadras.

"The rock of the hill, at first sight, appears to be a basalt; but, on examination, Señor Domeyko has determined it to be a variety of metamorphic porphyry, which he calls 'porfido abijarrado.' The columns of the rock have in various parts not only different directions, but various inclinations. However, the columns in the most southern part of the hill run W. 60° N. with an inclination of 36° to S.E.; the columns at the N. are nearly horizontal, with direction to W. a little to N. The upper part of the hill N.E. and S. is covered with a layer of earth, and not much vegetation; part of it also has broken stones (angular); but to the W., where there is a quarry, the heads of the columns are seen, and it is here where the hill is very steep. It has been necessary to enter into the above details to better understand the phenomenon I am about to refer to.

"In the N. part of the hill was erected, in 1849, the Astronomical Observatory, and it was then believed this was the most favourable position. I here only allude to the house which contains the transit instrument. The axis of the instrument rests on two blocks of stone of $6\frac{1}{2}$ feet, which are placed in solid masonry upon the firm rock, without touching any broken or soft parts of the rock.

"The rock that serves as foundation to this masonry, as I have already stated, is of the before-mentioned columns of porphyry; the direction of these is about in a line with the axis of the instrument, and with but little inclination. In the construction of the instrument, as well as in the fixing it, the greatest care

Downloaded from http://mnras.oxfordjournals.org/ by guest on August 16, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System